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REMARKS

The Examiner's Action mailed on August 25, 2004, has been received and its contents carefully considered. Additionally attached to this Amendment is a Petition for a Three-month Extension of Time, extending the period for response to February 25, 2005.

In this Amendment, Applicant has editorially amended the specification, amended claims 1 and 8, and canceled claims 7 and 14 through 16. Claim 20 has been added to the application. Claims 1, 8 and 20 are the independent claims. Claims 1-6, 8-13 and 17-20 are pending in the application. For at least the following reasons, it is submitted that this application is in condition for allowance.

Initially, it is noted that the Examiner is yet to acknowledge consideration of the references submitted with the Information Disclosure Statement submitted on June 18, 2004. Attached hereto is a courtesy copy of this Information Disclosure Statement, together with a Date-stamped Post Card receipt, evidencing receipt of this Information Disclosure Statement by the United States Patent and Trademark Office. Acknowledgement of consideration of the references listed on the enclosed Form PTO-1449 is requested.

The Examiner has objected to the disclosure for various informalities. In response thereto, the disclosure has been editorially amended to correct the informalities specifically raised by the Examiner's Action, and to correct other informalities noted during the review. It is requested that this objection be withdrawn.

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The Examiner's Action has rejected claims 1-6, 8-14 and 16-19 as being obvious over *Wang et al.* (USP 6,258,694) in view of *Prabhakar* (USP 5,869,359). Because independent claim 1 has been amended to include the subject matter of dependent claim 7, and because independent claim 8 has been amended to include the subject matter of dependent claim 15, these various rejections have been rendered moot.

The Examiner's Action has also rejected claims 7 and 15 as being obvious over *Wang et al.* in view of *Prabhakar*, and further in view of *Ishii et al.* (USP 6,596,593). Because claims 7 and 15 have been canceled and the subject matter recited therein amended into independent claims 1 and 8, respectively, Applicant will treat this rejection as pertaining to all of the claims currently pending in the application. It is submitted that these claims are *prima facie* patentably distinguishable over the cited combination of references for at least the following reasons.

Applicant's independent claim 1 and independent claim 8 each recite a method of fabricating a semiconductor device which includes oxidizing a surface of a silicon layer to form a pad oxide film. Oxygen ions are implanted through the pad oxide film and into the silicon layer. The parts of the silicon layer having the implanted oxygen ions are then oxidized, while the parts are still covered by the pad oxide film, to form isolation regions, which divide the silicon layer into a plurality of mutually isolated active regions.

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Applicant's claimed invention addresses two problems that were associated with SOI devices. The first problem is the lateral bird's beak elongation of the field oxide films which isolate the active elements from each other. The second problem is the abrupt vertical steps between the active element regions and the field oxide region, due to swelling when the field oxide is formed. These problems, as discussed in Applicant's specification, are especially troublesome in fully depleted SOI devices, in which the silicon semiconductor layer is extremely thin. Applicant's claimed method mitigates these problems by covering the semiconductor silicon layer 106 with a pad oxide film 108, implanting oxygen ions through the pad oxide film and into the semiconductor silicon layer, and then oxidizing the selected parts of the semiconductor silicon layer to form the field oxides 116. During the oxidation process, the overlying pad oxide 108 functions as an oxidation stopper that inhibits both vertical swelling and lateral extension of the oxide, so that the surface left at the end of the oxidation process is comparatively smooth and the lateral birds' beaks are comparatively small, as shown in figures 1B, 2B and 3C. Thus, Applicant's claimed invention has the following advantages. A first advantage is that the oxidation process is easier to control, since the pad oxide film functions as an oxidation stopper. A further advantage is that it is not necessary to excavate trenches or to implant a dopant to restrict lateral oxidation. Another advantage is that the present invention is applicable to fully depleted SOI devices having very thin semiconductor layers (such as, 40 nm or less). This claimed invention, the problems rectified thereby,

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and the advantages associated therewith, are neither disclosed nor suggested by any of the cited references.

Wang et al. disclose a fabrication method of a device isolation structure, in which a dopant 108 is implanted into a silicon substrate 100 to inhibit lateral oxidation. A trench 112 is then excavated in the silicon substrate 100, so that when the semiconductor silicon substrate is oxidized, it swells, with the swelling filling the trench without protruding greatly beyond the original surface of the silicon substrate 100.

However, it is noted that this reference not only does not disclose or suggest oxidizing parts of the silicon layer into which oxygen ions have been implanted while the parts are still covered by a pad oxide film, as recited by claim 1, but this reference would specifically appear to teach away from this feature, due to the requirement of the formation of the trench 112. That is, although this reference does disclose a silicon oxide layer 102, it is required that the portion of the silicon oxide 102 over the part of the silicon substrate 100 having the ions implanted therein, be removed, in order to allow the formation of the trench. Thus, even though various ones of the cited references may disclose various constituent elements of Applicant's claimed invention, there would have been no motivation for one skilled in the art to have modified the teachings of *Wang et al.* with the disclosures from the other cited references, except in a hindsight attempt of reconstructing Applicant's claimed invention, since to do so would be against the teaching of *Wang et al.* As such, it is submitted that Applicant's independent

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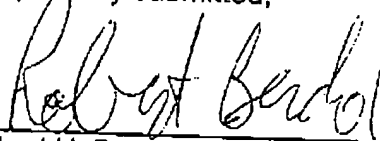
claims 1 and 8, and the claims dependent therefrom, are *prima facie* patentably distinguishable over the cited combination of references. It is thus requested that these claims be allowed and that these rejections be withdrawn.

Applicant has further added independent claim 20, which is submitted to be *prima facie* patentably distinguishable over the cited references for reasons similar to those given above with respect to independent claims 1 and 8. It is likewise requested that this claim be allowed.

It is submitted that this application is in condition for allowance. Such action and the passing of this case to issue are requested.

Should the Examiner feel that a conference would help to expedite the prosecution of this application, the Examiner is hereby invited to contact the undersigned counsel to arrange for such an interview.

Respectfully submitted,



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